CLAIMS

We claim:

1. A load-lock and dry vacuum pump assembly, comprising:

a load-lock having a load-lock housing, said load-lock housing including a mating system, wherein said mating system includes a flange-like cylinder, and a cylinder concentrically located relative to said flange-like cylinder,

a dry vacuum pump integrally connected with said mating system, said dry vacuum pump including a shaft, a rotor, a first concentric cylinder and a second concentric cylinder extending outwardly from said rotor, wherein said first and said second concentric cylinders, said flange-like cylinder, and said cylinder concentrically located relative to said flange are axially arranged with respect to said shaft, and

flanges having helical structures selectively provided on said first and said second concentric cylinders, said flange-like cylinder, and said cylinder concentrically located relative said flange, and wherein said first and said second concentric cylinders spin relative to said flange-like cylinder and said cylinder concentrically located relative said flange to form a molecular drag compression stage.

2. An assembly according to claim 1, wherein said dry vacuum pump includes a pump housing having a body portion, said body portion including a plurality of concentric circular channels, and wherein said rotor includes an upper surface and a lower surface, and a plurality of raised rings provided on said lower surface, said plurality of raised rings symmetrically situated about said shaft, and said plurality of concentric circular channels accommodating said plurality of raised rings to form a regenerative compression stage.

3. An assembly according to claim 2, wherein said molecular drag compression stage is connected to said regenerative compression stage, and together said molecular drag compression stage and said regenerative compression stage are adapted to remove gas disposed within said load-lock.

4. An assembly according to claim 3, wherein said flanges are provided on the inner facing surface of said flange-like cylinder, and the inner and outer facing surfaces of said cylinder concentrically located relative to said flange-like cylinder.

5. A load-lock and dry vacuum pump assembly, comprising:

a load-lock having a housing, at least one load-lock chamber provided in said load-lock housing, at least one loading port and at least one unloading port provided to said at least one load-lock chamber, and a mating system, wherein said mating system includes a flange-like cylinder; and

a dry vacuum pump having a shaft, a rotor securely attached to said shaft, and a body portion through which said shaft extends, wherein said body portion in attached to said flange-like cylinder.

6. An assembly according to claim 5, wherein said load-lock housing includes a first load-lock chamber and a second load-lock chamber, said dry vacuum pump separately evacuating said first load-lock chamber and said second load-lock chamber.

7. An assembly according to claim 6, wherein said first load-lock chamber includes a first loading port and a first unloading port, and said second load-lock chamber includes a second loading port and a second unloading port.

8. An assembly according to claim 7, wherein said first and second loading ports and said first and second unloading ports include slit valves adapted to prevent atmospheric air from respectively entering said first load-lock chamber and said second load-lock chamber.

9. An assembly according to claim 5, further comprising a first concentric cylinder and a second concentric cylinder extending outwardly from said rotor, wherein said flange-like cylinder surrounds said first concentric cylinder and said second concentric cylinder, and a concentric cylinder attached to said flange-like cylinder is positioned between said first concentric cylinder and said second concentric cylinder.

10. An assembly according to claim 9, further comprising substantially uniform gaps formed between said first concentric and said concentric cylinder, between said second concentric cylinder and said concentric cylinder, and between said second concentric cylinder and said flange-like cylinder, wherein flanges having helical structures are provided within said substantially uniform gaps.

11. An assembly according to claim 10, wherein a first of said flanges is attached to the inner facing surface of said concentric cylinder, a second of said flanges is attached to the outer facing surface of said concentric cylinder, and a third of said flanges is attached to the inner facing surface of said flange-like cylinder.

12. An assembly according to claim 5, further comprising a molecular drag compression stage comprising said flange-like cylinder and a concentric cylinder attached to said flange-like cylinder interleaved with a first concentric cylinder and a second concentric cylinder, and flanges selectively disposed on said first concentric cylinder, said second concentric cylinder, said flange-like cylinder, and said concentric cylinder attached to said flange-like cylinder, wherein said first concentric cylinder and said second concentric cylinder extend outwardly from said rotor, said first concentric cylinder and said second concentric cylinder adapted to spin relative to said flange-like cylinder and said concentric cylinder attached to said flange-like cylinder

13. An assembly according to claim 12, further comprising a regenerative compression stage formed between said rotor and said body portion, wherein concentric circular channels are formed within said body portion, and wherein said rotor has an upper surface and a lower surface, wherein various raised rings are disposed on said lower surface, and a series of spaced blades are mounted on each of said various raised rings, said various raised rings and said series of spaced blades mounted on each of said various raised rings fitting within said concentric circular channels.

14. An assembly according to claim 5, further comprising a regenerative compression

stage formed between said rotor and said body portion, wherein concentric circular channels are formed within said body portion, and wherein said rotor has an upper surface and a lower surface, wherein various raised rings are disposed on said lower surface, and a series of spaced blades are mounted on each of said various raised rings, said various raised rings and said series of spaced blades mounted on each of said various raised rings fitting within said concentric circular channels.

15. An assembly according to claim 5, wherein said body portion of said dry vacuum pump is attached directly to said flange-like cylinder to integrally connect said load-lock with said dry vacuum pump.

16. An assembly according to claim 5, wherein said load-lock housing includes a bottom wall, and at least one passage is provided through said bottom wall to allow for fluid communication between said at least one load-lock chamber and said dry vacuum pump.

17. An assembly according to claim 16, wherein said load-lock housing includes a first load-lock chamber, a second load-lock chamber, a first passage through said bottom wall which provides communication between said dry vacuum pump and said first load-lock chamber and a second passage through said bottom wall which provides communication between said dry vacuum pump and said second load-lock chamber.

18. An assembly according to claim 17, further comprising valves disposed within each of said first passage and said second passage, said valves selectively providing communication between said dry vacuum pump and said first load-lock chamber and said second load-lock chamber.

19. An assembly according to claim 5, further comprising a regenerative compression stage formed within said dry vacuum pump, and a molecular drag compression stage formed by components shared by said load-lock and said dry vacuum pump.